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ABSTRACT

This training manual for emergency medical technicians, one of 14 modules that comprise the Emergency Victim Care textbook, covers medical emergencies. The objectives for the chapter are for students to be able to describe the causes, signs, and symptoms for specified medical emergencies and to describe emergency care for them. Informative material is provided on myocardial infarction, angina pectoris, congestive heart failure, stroke, transient ischemic attack, diabetic reactions, abdominal disorders, poisons, snakebite, contagious diseases, emphysema, hyperventilation, asthma, and epilepsy and convulsions. (YLB)

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EMERGENCY VICTIM CARE

Module 7 —Medical Emergencies

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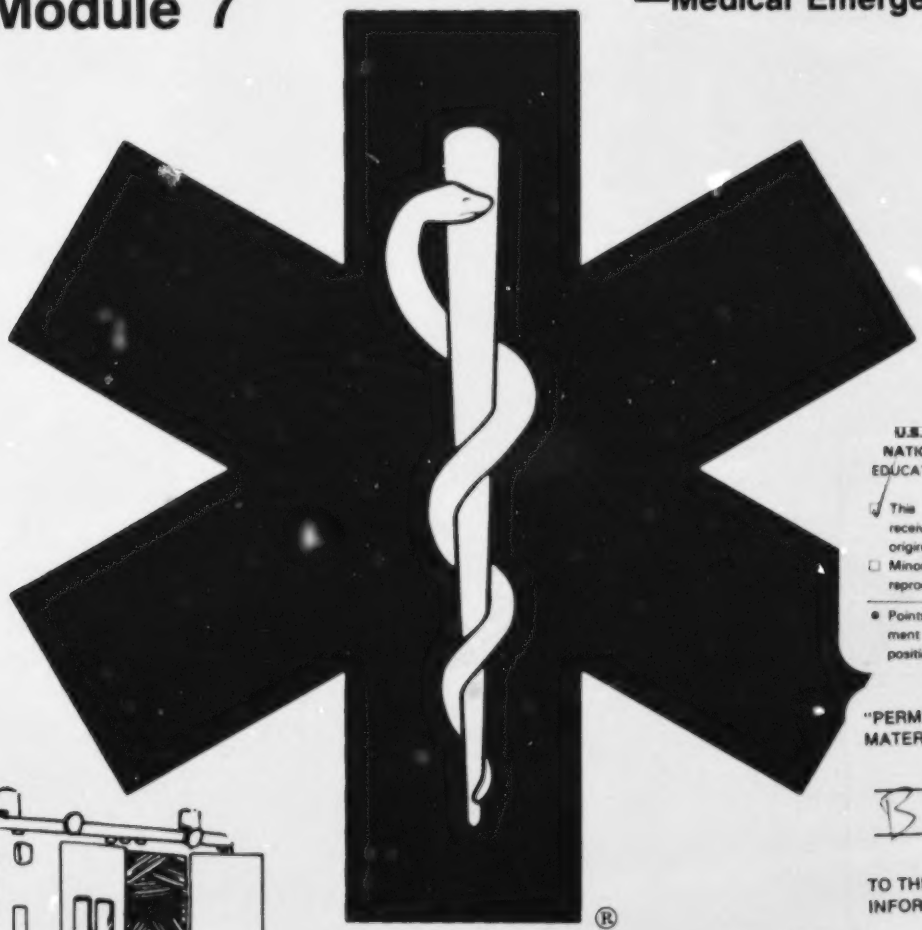

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EMERGENCY VICTIM CARE

A TRAINING MANUAL FOR EMERGENCY MEDICAL TECHNICIANS

OHIO TRADE AND INDUSTRIAL EDUCATION SERVICE

DIVISION OF VOCATIONAL EDUCATION
STATE DEPARTMENT OF EDUCATION
COLUMBUS, OHIO

TO THE LEARNER

The 1983 Emergency Victim Care textbook revision has been grouped into 14 modules. The modules have been grouped by content matter as follows:

Module 1

Preface
Foreword
Acknowledgment
Student-Instructor Relationship

Personnel
Emergency Medical Service Vehicles
EMS Communication
Records and Reports

Module 2

Equipment
Safe Driving Practices
Legal Aspects
Controlling the Situation
Action Evaluation Conference

Module 3

Anatomy & Physiology

Module 4

Vital Signs
Patient Assessment

Module 5

Cardiopulmonary Resuscitation (CPR)

Module 6

Bleeding Control
Wounds and Bandaging
Shock

Module 7

Medical Emergencies

Module 8

Crisis Intervention
Drug-Related Problems

Module 9

Backboards/Moving and Handling the Victim
Fractures
Dislocations

Module 10

Injuries of the Eye, Ear, Nose, Abdomen, C.N.S. and Genitalia
Burns and Environmental Injuries

Module 11

Childbirth
Pediatric Emergency

Module 12

Water Accidents
Electrical Emergencies
Hazardous Materials and Radiation Accidents

Module 13

Extrication from Automobiles

Module 14

Appendix I: Communicating with Deaf and Hearing Impaired Patients
Appendix II: Medical Terminology
Appendix III: EMS Organizations
Appendix IV: Legislation
Glossary of Terms
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MEDICAL EMERGENCIES

OBJECTIVES

Upon completion of the following chapter, you will be able to:

—describe the causes, signs and symptoms for the specified medical emergencies.

—describe emergency care for specified medical emergencies, such as:

- —Heart attack
- —Congestive heart failure
- —Stroke
- —Diabetic reactions
- —Abdominal disorders
- —Poisons
- —Snakebites
- —Contagious disease
- —Emphysema
- —Hyperventilation
- —Asthma
- —Epilepsy

Following instruction and/or practice, you will be able to:

—demonstrate emergency treatment for specified emergencies.

INTRODUCTION

Medical emergencies comprise the majority of calls answered by EMTs. It is important, therefore, to learn the signs and symptoms of each medical emergency so the proper care can be given to the victim. Earlier in the text the importance of patient assessment, learning the victim's medical history and assessing the victim's vital signs was stressed. All these skills are important when dealing with a medical emergency.

MYOCARDIAL INFARCTION

Usually a "heart attack" means an acute condition doctors call **myocardial infarction.** It is a sudden blocking of one of the coronary arteries that supplies the heart muscle with blood. See Figure 1.

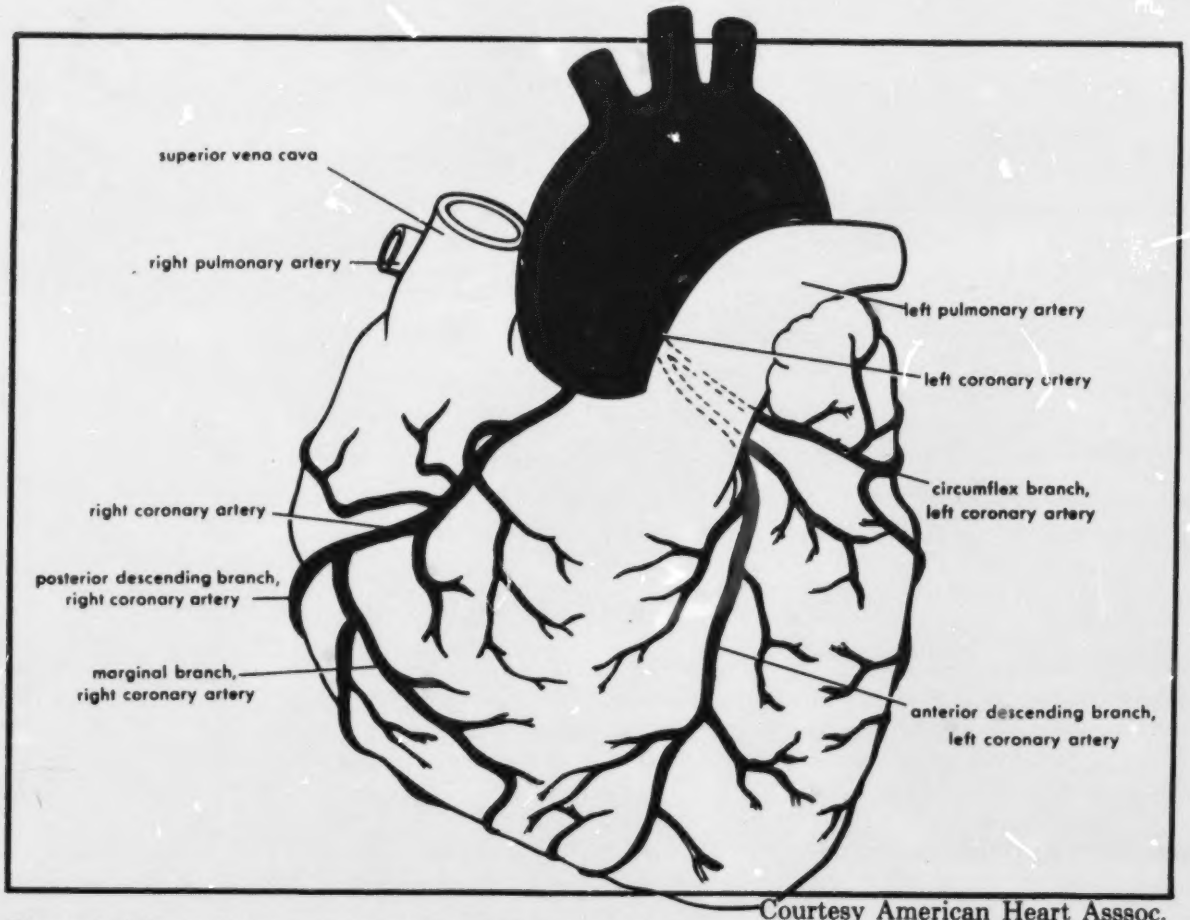
Although a heart attack itself is sudden, it is the result of atherosclerosis; a slowly developing disease of the coronary arteries. Atherosclerosis causes most heart attacks and the chest pain called angina pectoris. It is a form of arteriosclerosis (hardening of the arteries).

In atherosclerosis, the passageway through the arteries becomes roughened and narrowed by fatty deposits that harden into patches along the inner lining of the artery. This process has been compared to the formation of lime deposits in a water pipe. Around the patches, scar-like, fibrous tissue forms in the artery wall so that the channel is narrowed and there is less room allowed for the flow of blood. See Figures 2A and 2B.

A blood clot can form in an artery narrowed by atherosclerosis. This blocks the channel and cuts off the blood flow to the part of the heart supplied by the artery. See Figures 3A and 3B.

When a clot (thrombus) cuts off the blood supply to a section of heart muscle, the result is a heart attack. Physicians call it a coronary thrombosis, coronary occlusion, or myocardial infarction. The usual symptoms are:

1. Severe painful sensation of pressure under the breastbone, often lasting for hours. (Mild attacks are sometimes mistaken for acute indigestion.)
2. Sudden intense shortness of breath.
3. Sudden apprehension or fear.


superior vena cava
right pulmonary artery
left pulmonary artery
left coronary artery
circumflex branch, left coronary artery
right coronary artery
posterior descending branch, right coronary artery
marginal branch, right coronary artery
anterior descending branch, left coronary artery

Courtesy American Heart Asssoc.

Figure 1. The main coronary arteries with their many branches come down over the top of the heart like a crown (corona) and send successively smaller branches or twigs down into all parts of the heart muscle to supply it with oxygen-carrying blood.

4. Increased activity and restlessness.

5. Shock.

6. Loss of consciousness (occasionally).

7. Heart rate may be outside normal limits (60-100 BPM) and may be irregular.

COLLATERIAL CIRCULATION

The coronary artery system has a lifesaving method of growth and repair. When some of the coronary arteries become so narrowed by gradual development of atherosclerosis to the point they cannot carry enough blood to the heart muscle, nearby arteries widen and open up tiny new branches to deliver blood to the area of the muscle in need. This is called collateral circulation.

This collateral or substitute circulation often develops while the main coronary arteries are becoming narrowed. This explains why many who have narrowed arteries are not troubled with angina pectoris or heart attacks. Once a heart attack occurs, the development of the collateral circulation may help the heart to mend itself.

Courtesy American Heart Assoc.

Figure 2A *Figure 2B*

Figure 2A shows a cross section of a normal artery greatly enlarged. Figure 2B shows deposits found in the inner lining.

Courtesy American Heart Assoc.

Figure 3A *Figure 3B*

Deposits harden, then a blood clot blocks the narrowed channel.

TECHNICAL INSTRUCTIONS FOR EMTs CONCERNING MYOCARDIAL INFARCTION

THE TISSUES INVOLVED

The blood vessels of the body are made up of three layers: (1) an outer protective layer, (2) a muscular center layer and (3) a smooth inner layer. The smooth inner layer (intima) is the layer most involved in the coronary attack.

BLOOD SUPPLY SHUT OFF

Persons experiencing fear or pain become very tense; all their muscles tend to tighten. The pain a victim experiences due to formation of a clot within the coronary artery and associated fear causes the muscular layer of the blood vessels around the clot to clamp down. If this muscular layer does not relax, blood will be unable to pass the affected area. The part of the heart involved will die.

It is of the greatest importance to do everything possible to help a victim to relax. EMTs who are confident, skilled, and compassionate greatly contribute to the relaxation of the victim.

SIGNS AND SYMPTOMS

The following symptoms will be exhibited by a heart attack victim.

Severe Pain—This pain will be over the front of the chest. It may radiate to the shoulder, arm, hand, or jaw. The victim may complain of pain or just squeezing in the aforementioned parts.

Heart Rate—The heart rate may be normal, fast, or slow; regular or irregular.

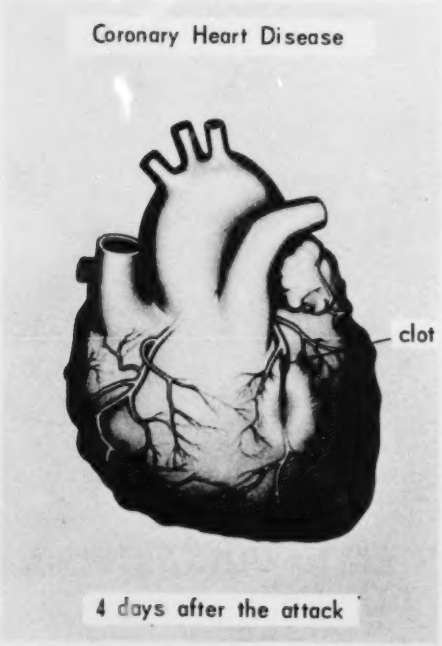
Shortness of Breath—This is a normal symptom for many heart victims, however, very dramatic and severe.

Apprehension or Fear—This is due to the pain and the thought of impending death. The face will show fright, and the eyes will open widely.

Activity and Restlessness—The victim will continuously try to move about and get up. If able to get up, the victim will pace up and down.

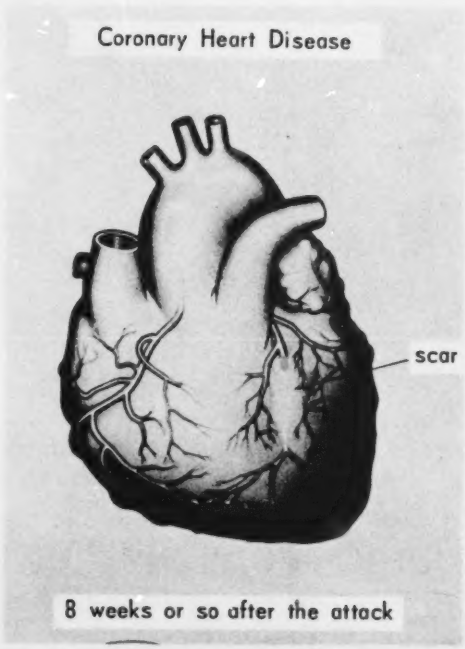
Shock—All symptoms of shock may be evident. Actually, some victims are in shock during the entire attack.

Fainting—This may occur in the beginning or later in the attack. It sometimes is the first sign and will be followed by the other symptoms mentioned. It is a serious warning.



Courtesy American Heart Assoc.

Figure 4. White cells are clearing away the dead tissue. Scar tissue is beginning to form at the edges of the damaged area (just below the clot). The patient must remain quiet because during the first two weeks or so there is danger that this weak spot will rupture.



Courtesy American Heart Assoc.

Figure 5. Tough scar tissue has formed. The patient begins to resume activities. The patient's weight must be kept down to avoid severe mental and physical strain. Moderate physical activity is encouraged.

EMERGENCY CARE

For victims suffering from a myocardial infarction, physicians administer medicine which not only relieves pain but also relaxes the victim. EMTs may assist in administering medication such as nitroglycerin or nitro-stat which is prescribed for pain. Caution: the victim should only be allowed to have three nitroglycerin or nitrostat pills in a 15-minute period.

The victim should be given oxygen in the highest concentration possible. Due to fear and desperation, the coronary victim will often fight the EMT who approaches with the mask for fear of smothering.

Do not fight with the victim. If the victim will not take oxygen by mask, disconnect the mask from the outlet and hold the outlet in front of the victim's nostrils. In this way a high concentration of oxygen will be given, making the victim rest more easily. Caution: Oxygen should be at room temperature. Oxygen that is at a temperature lower than room temperature may cause further constriction of the blood vessels.

Talk to the victim, explaining exactly what will be done and why. Understanding what is being done and why will help alleviate the victim's fear and thus help make the victim more relaxed.

Every effort should be made to keep the victim from being active as this puts extra stress on the heart. Do not allow the victim to move

more than necessary. The victim must be kept at rest.

If the heart rate is abnormal the EMT should alert hospital personnel of this problem.

The care of a heart victim in shock is somewhat different than usual. Three important words to remember are: (1) heat, (2) position, and (3) fluids.

Conserve body heat by using a blanket, but do not make the victim too warm. If the victim experiences a smothering effect, do not put the blanket further up than is comfortable. Do not fight the victim.

The victim should be placed in the most comfortable position possible. Some victims will feel best lying flat, others prefer partial or definite sitting position. Again, do not fight with the victim. Care for and transport the victim in the most comfortable position possible.

Give the victim only small amounts of water to sip, or just moisten the victim's lips. If given too much fluid, the victim may vomit. This in turn will place an additional strain on the victim's heart. **The water should not be ice water.**

If the victim should become unconscious, keep a careful watch of the air passage. If the victim should stop breathing, apply artificial respiration immediately.

TRANSPORTATION

In the care of coronary victims it has been stressed that everything possible should be done to keep the victim comfortable and at rest. Transportation of a victim should be carried out at a **moderate speed with no flashing lights or siren.** It is obvious that a fast trip to the hospital with a blaring siren would not contribute to the well-being of the victim and would probably produce additional fear. The use of oxygen should be continued during transportation of a heart victim.

RECOVERING FROM A MYOCARDIAL INFARCTION

When a clot suddenly shuts off the supply of blood to a part of the heart muscle, the central part of the area deprived of blood may die. The affected area must heal to form strong scar tissue. At the same time, a new blood supply to the affected area develops by means of the collateral circulation described. See Figures 4 and 5.

Treatment is aimed at giving the heart time to mend itself. Even though the patient may feel well after the first week, continual rest in a bed or chair is needed to give the heart time to heal.

Recovery time for the patient will depend on the extent of the heart injury, the rate of healing, and whether or not complications develop. Although medicines are helpful, the patient's cooperation and understanding play a large part in recovery.

ANGINA PECTORIS

Angina pectoris is a severe chest pain that signifies the heart muscle is not getting enough oxygen through its blood supply. It usually means some of the coronary arteries have become so narrowed by atherosclerosis that they do not let enough blood through to supply the demands of the heart muscle.

An individual may complain of severe chest pain with a sensation of oppression under the breastbone or strangling. The pain may be accompanied by numbness and often spreads to the left shoulder, arm, or hand. Some victims regard the discomfort as minor in degree and often describe it as "misery" or "burning sensation." This is a typical anginal attack or episode. It is usually brought on by effort,

excitement, or after a heavy meal. The pain does not last long. As a rule, it is relieved within a short time by rest or nitroglycerine.

Sometimes anginal pains occur in persons who have recovered from a heart attack. Sometimes they occur in people who have never had a heart attack and who may never have one. Chest pain, however, may result from other causes. It should always be reported to a physician.

LIVING WITH ANGINA PECTORIS

The same process of collateral circulation that increases the blood supply to the heart muscle after a heart attack can also come to the aid of the patient with angina pectoris. Given time, some branches of the coronary arteries may enlarge and new branches open to deliver enough blood to the heart muscle enabling the individual to carry on normal activities.

Most persons can be comfortable and lead productive lives even though they must cope with angina pectoris. Each case is individual; only the patient's doctor can determine the course to be followed and the medication to be taken.

Regulating habits of life is important in controlling anginal attacks. The physician and patient must work out a program together.

As a rule, patients who have had angina pectoris should avoid overexertion, rushing, worrying, intense cold, smoking, and overeating. They are advised to eat four small meals daily rather than three heavy meals and should rest 20 minutes or more after eating.

Certain drugs are helpful, too. The physician almost always prescribes nitroglycerin tablets. The patient is told to let a tablet dissolve under the tongue to relieve the pain of angina. If expecting to be in a difficult or exciting situation, often the patient is told to take a tablet beforehand to avoid an attack of anginal pain.

CONGESTIVE HEART FAILURE

CAUSES

Congestive heart failure, commonly referred to as C.H.F., is usually a result of old age or a former heart condition that has weakened the heart. Actually, the condition is a weak heart.

Because of congestive heart failure the heart is unable to do its usual work. In the section on anatomy and physiology we learned the heart has two pumps, the right ventricle that pumps blood into the lungs and the left ventricle that pumps blood to the body.

Most heart failures are left heart failure or a combination of left and right heart failure. When the left ventricle fails, it is unable to handle the blood returning from the lungs. Therefore, blood accumulates in the lungs. If the lungs contain too much blood, certain fluids from the blood will seep into the alveoli (air sac) and the flow of blood to the lungs from the right ventricle will be reduced. Oxygen will not be exchanged from the lungs to the blood because of the alveoli being blocked by excessive blood and fluids, and blood may back up in all parts of the body, thus explaining the edema (swelling) when it is present.

SIGNS AND SYMPTOMS

Severe Fatigue—The victim may hardly be able to move and scarcely able to talk. The victim may look like a person who has just run a long distance.

Shortness of Breath—Shortness of breath is caused by fluid in the lung tissue. Since the heart is unable to pump enough blood to the lungs, enough oxygen is not supplied to the body. Therefore, the body has a constant need for adequate oxygen. The victim will have long inspirations and long exhalations. At times, these inspirations and exhalations will be slow and at other times they will be fast. The victim will

also have "noisy" respirations due to the poor circulation and congestion in the lungs.

Swelling of Hands, Ankles, and Feet—This swelling is due to the accumulation of body waste products in the tissues.

Shock—The victim will be in a condition of shock during the attack and will exhibit extreme perspiration.

EMERGENCY CARE

Severe Fatigue—Since any activity on the part of the victim will cause the attack to become worse, the EMT should attempt to anticipate the victim's every need. so it will be unnecessary for the victim to move.

Shortness of Breath—Oxygen should be used. A victim with this symptom will exhibit oxygen hunger rather than oxygen fear or avoidance.

Noisy Respiration—This condition can be somewhat relieved by the EMT using the following procedure, if the inhalator in service contains a breathing bag.

1. When giving the victim oxygen, let the inhalator bag fill to capacity.

2. On the next inspiration squeeze the inhalator bag, keeping the face piece snugly against the victim's face.

3. Keep up this procedure, if possible, until the victim is under medical care.

This practice will cause the oxygen to push the excess fluid in the air sacs of the lungs back into the circulating blood. If the inhalator does not contain a breathing bag, it will be impossible to carry out the procedure.

A bag-valve-mask device with a high concentration of flowing oxygen can accomplish the same results. The EMT squeezes the bag on the victim's inpsirations.

Shock—The usual shock care must be varied for this particular condition.

1. **Heat**—Cover the victim to conserve body heat. Do not overheat the victim.

2. **Position**—The victim will want to stay in a position in which the chest is elevated, or in an actual sitting position. Do not force the victim to lie down; the fluid in the lungs can cause drowning.

The chronic heart failure victim usually has lived with this condition for years, and may even sleep in a chair to keep the chest elevated at all times.

3. **Fluids**—Give only small amounts of water. The victim will usually want the lips moistened.

After preparation has been made for transport, try to keep the victim comfortable at all times. If the head and chest must be lowered for a short time to carry out transportation, **explain this to the victim before doing so.**

Acute pulmonary edema is the result of serious congestive heart failure. When pulmonary congestion spreads to alveoli (air sacs) the characteristic signs and symptoms of coughing, severe shortness of breath, wheezing, and frothy pink sputum signals the presence of acute pulmonary edema.

ROTATING TOURNIQUETS

A procedure used in the treatment of acute pulmonary edema is the application of tourniquets to the extremities. This procedure will aid in relieving the victim's symptoms by slowing down circulation, pooling blood in the extremities and, as a result, decreasing the workload on the heart. **This procedure is to be used only on approval of emergency medical service advisor or the receiving hospital.**

1. A padding may be applied around each extremity where the tourniquet is to be applied if rubber tourniquets are used. If B/P cuffs are used, this is unnecessary.

2. Tourniquet or cuff should be applied as high on the arm and leg as possible.

3. Check the arterial pulse. Never apply tourniquet so tightly that the pulse cannot be felt.

If ankles are too swollen to feel the pulse, try to apply with same amount of pressure as on arm.

4. Use **only three** of the four extremities at one time.

5. Treatment can be prolonged over a period of time by rotating the tourniquets or cuffs so that a different extremity is freed about every 10 to 15 minutes.

6. Free the extremities, one at a time, by moving the tourniquets in a clockwise manner (facing the victim as shown in Figure 6).

7. This treatment causes discoloration, swelling and discomfort in the extremities. It is not harmful as long as the pulse can be felt while the tourniquet is in place.

8. When the therapy is to be discontinued, the tourniquets or cuffs should be removed one at a time every 10 to 15 minutes to prevent overstrain on the heart from the blood returning all at one time. However, the EMT should not remove the tourniquets unless advised to do so by a physician.

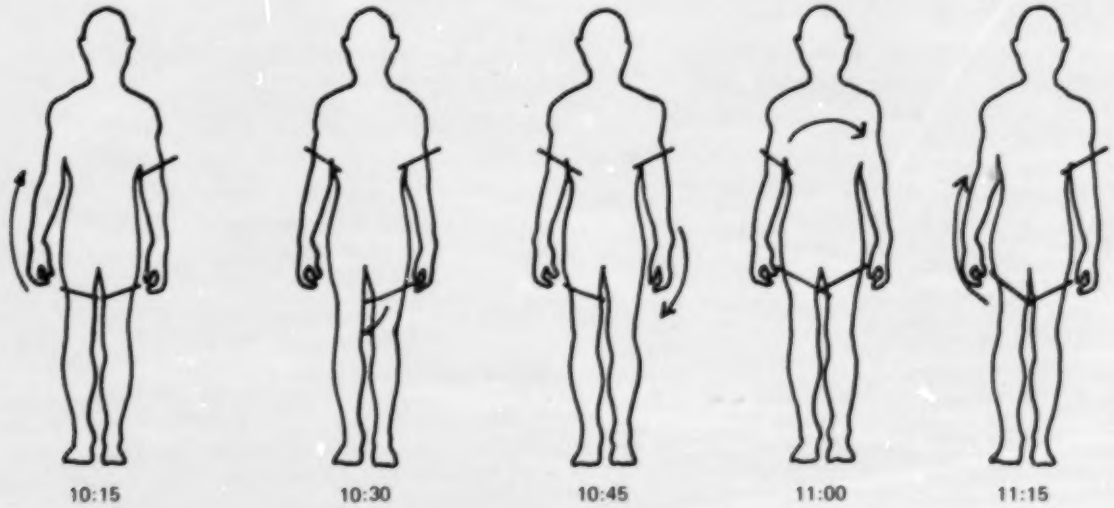


Figure 6. Tourniquet rotation sequence

STROKE (CEREBROVASCULAR ACCIDENT)

DEFINITION

A stroke is a sudden paralysis with total or partial loss of consciousness due to part of the brain being deprived of blood supply.

CAUSE

Many times it is difficult to determine the cause or causes of a particular stroke until extensive medical examinations are completed. The usual causes, however, are hemorrhaging or clotting.

The most frequent cause of stroke is the blocking of a cerebral artery by a clot (called a thrombus) that forms inside the artery. This condition is known as cerebral thrombosis. See Figure 7.

A clot is not likely to occur in a healthy artery; but due to hardening or thickening, deposits form on the inner lining of the artery. This condition is known as atherosclerosis and is responsible for triggering the clotting mechanism.

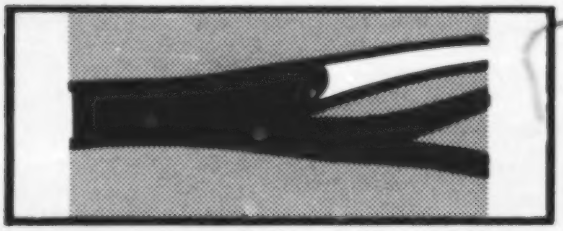


Figure 7. Clotting

Another cause of stroke is a cerebral hemorrhage. As a result of atherosclerosis and high blood pressure, the artery wall may burst and flood the delicate brain tissue with blood. Not only does this hemorrhage deprive a portion of the brain of food and oxygen, it also forms clots that displace and damage surrounding brain tissue. See Figure 8.

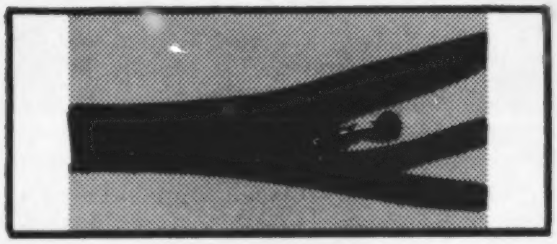


Figure 8. Hemorrhage

Bleeding of an artery in the brain may also be caused by a head injury or a weak spot in the artery wall.

Sometimes a traveling clot, called an embolus, is carried in the bloodstream and becomes lodged in one of the arteries in the brain. This is called a cerebral embolism, and it also interferes with the flow of blood to the brain.

A stroke may also be caused by pressure on the brain or its blood vessels. When hemorrhaging occurs, the escaping blood may clot and form a solid mass that presses against a nearby artery; or a tumor, an abnormal growth of tissue, may compress an artery or the surrounding brain tissue. See Figure 9.

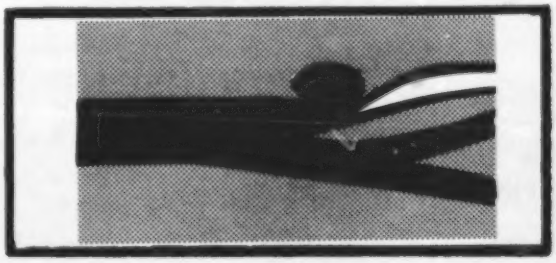


Figure 9. Compression

SIGNS AND SYMPTOMS

The onset of a stroke is usually sudden. The victim may collapse and later lapse into unconsciousness. There may be a feeling of numbness in an extremity progressing to paralysis.

The face and mouth may pull to one side and the pupils of the eyes are often of unequal size. If conscious, the victim may exhibit mental confusion, the inability to concentrate, slurred speech, and signs of nausea and vomiting. The victim may be combative or unruly or may display a complete change of personality. Respirations may be regular or irregular. Certain hesitations in the breathing patterns are common in victims of a stroke. The important consideration is whether breathing is sufficient or supportive assistance is needed. The blood pressure may be high or normal. A high blood pressure usually means an artery is still bleeding into the cranial cavity and the pressure is not relieved. These victims must be watched closely because their condition may change rapidly. A normal blood pressure usually means the "bleed" has already occurred. Remember, symptoms will vary with the extent of brain damage; but in the majority of stroke victims the usual signs and symptoms will be quite evident.

EMERGENCY CARE

1. Take vital signs as soon as possible.
   a. Is respiration regular or irregular? Some victims may show a very irregular pattern of breathing. Is the victim's breathing sufficient or will supportive respiratory assistance be needed?
   b. Is the pulse regular or irregular? An irregular pulse may indicate an underlying heart problem.
   c. The blood pressure may be high or normal. A high blood pressure with a slow pulse may be an indication of marked swelling of the brain. Immediate care by a physician is necessary.
2. Lay the victim down with the head in a slightly elevated position.
3. Do not give anything by mouth and definitely no stimulants. If the victim vomits, roll victim on side to facilitate the flow of vomitus.
4. Maintain airway as needed, and administer oxygen by inhalation (five liters per minute). If the victim stops breathing, begin resuscitation immediately.
5. Shield the victim from curious onlookers.
6. Transport the victim carefully, avoiding all unnecessary movement that may aggravate the stroke condition.
7. Give the victim thoughtful, tender loving care.

Note: Though unable to speak or though appearing unconscious, the victim may be able to hear and understand everything taking place.

TRANSIENT ISCHEMIC ATTACK (TIA)

DEFINITION

Transient ischemic attack (TIA) is a condition that occurs when there is a short-term interruption of the blood and oxygen supply to the brain. Some persons may suffer from a TIA prior to experiencing a cerebrovascular accident. A TIA is brief and localized to a small area of the brain. Recovery usually occurs within 12 hours or less without any residual brain damage. In rare cases, recovery time may be as long as 24 hours.

CAUSE

A TIA results from the temporary closing of small intracranial arteries by blood clots from arteriosclerosis, a sudden drop in blood pressure or cardiac output. It can also occur from mechanical compression of an artery in the neck by a simple turning of the head.

SIGNS AND SYMPTOMS

The most common signs and symptoms of a TIA may be a headache, lightheadedness, diz-

ziness or fainting. Some victims may suffer from a temporary loss of muscle tone in the involved extremities, blurred vision, slurring of speech, confusion or seizures. The signs and symptoms are only temporary; however, the victim should be made aware of the fact TIA may serve as a warning of an impending C.V.A.

EMERGENCY CARE

The EMT who encounters a victim suspected of having a TIA should encourage the victim to seek immediate medical attention. The same problems that cause a TIA can cause a major cerebrovascular accident. Careful medical supervision of the underlying cause of a TIA could be important in preventing a stroke.

DIABETIC REACTIONS (DIABETIC COMA AND INSULIN SHOCK)

DEFINITION AND CAUSE OF DIABETES

The basic cause of diabetes has not yet been found, but it is related to the partial failure of the pancreas. This is a large gland lying behind the stomach. Juices secreted by the pancreas help in digesting food.

One of the hormones made by the pancreas is insulin. This is produced by the so-called Islets of Langerhans—groups of cells scattered through the pancreas like islands. The word **insulin** comes from a Latin word meaning **island.**

Insulin's principal job is to help the body use glucose. Diabetes may develop because the body loses its ability to burn sugar or because the body is making too much sugar. These causes can be traced to a lack of insulin. When given the right amount of insulin by injection, the sugar in the diabetic's blood drops to normal and none is carried off through the urine. See Figure 10.

Due to a neglected diet, failure to take insulin, or other reasons, the diabetic can go into either of two conditions: diabetic ketoacidosis or insulin shock.

DIABETIC KETOACIDOSIS (DKA) (DIABETIC COMA)

This condition is caused by an inadequate amount of insulin which results in the incomplete oxidation of fatty acids, which produces acetone bodies and is common in uncontrolled diabetes.

Clothing of any person in a coma should be checked for a **medic alert emblem** or a card which states the victim is a diabetic. Relatives or friends may volunteer the information.

SIGNS OR SYMPTOMS

1. The victim may be confused and unable to cooperate.

2. The victim may feel weak and experience dizziness.

3. The victim may feel nauseous and vomiting may be present.

4. The victim's breathing is characterized by rapid, very deep—yet not labored—respiratory movements. There is no evidence of obstruction of the air passages or any blueness.

5. The skin is dry and flushed.

6. The breath has a sweetish or fruity odor which is acetone.

EMERGENCY CARE

Since this victim needs insulin and the EMT is not permitted to administer it, transport the victim to a hospital immediately. This victim requires careful, expert and immediate attention from a physician. If the victim is unconscious, check the refrigerator for insulin. If any is found, make the hospital personnel aware of the type.

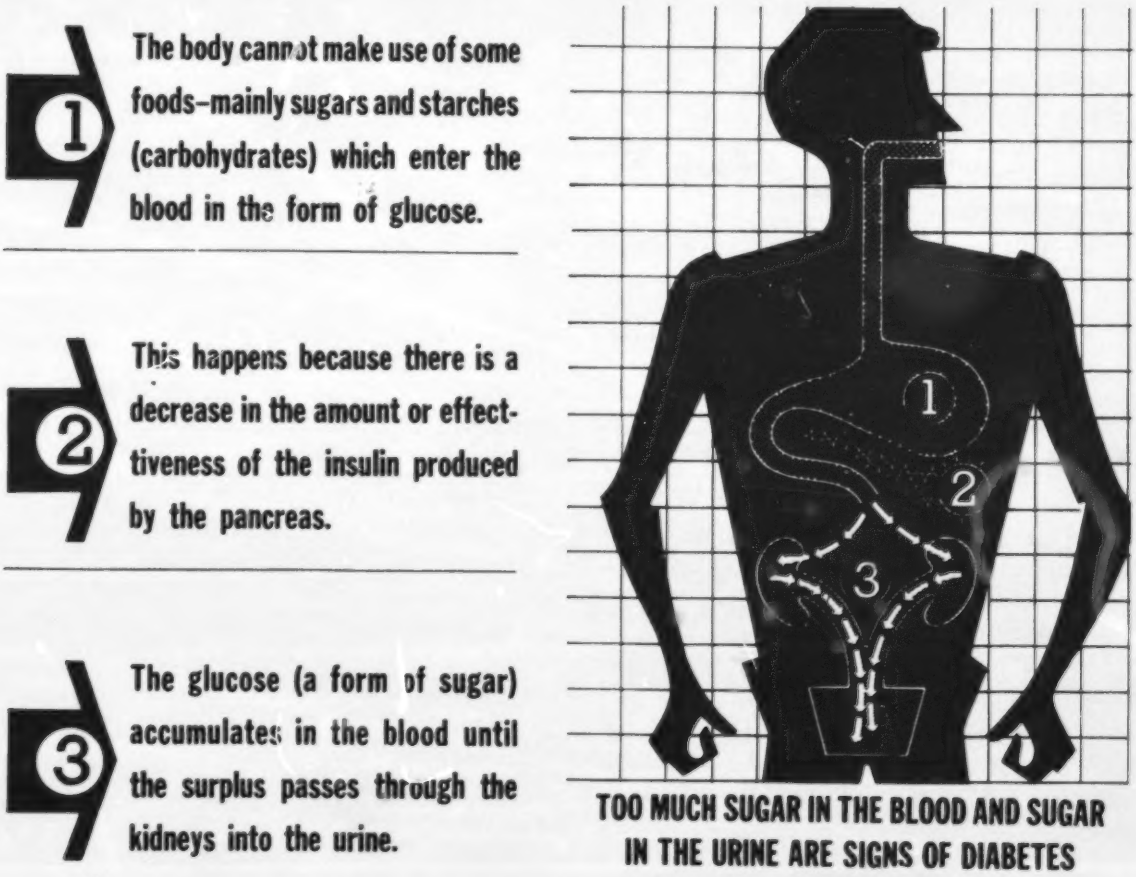

1
The body cannot make use of some foods–mainly sugars and starches (carbohydrates) which enter the blood in the form of glucose.
2
This happens because there is a decrease in the amount or effectiveness of the insulin produced by the pancreas.
3
The glucose (a form of sugar) accumulates in the blood until the surplus passes through the kidneys into the urine.
1
2
3
TOO MUCH SUGAR IN THE BLOOD AND SUGAR IN THE URINE ARE SIGNS OF DIABETES
Courtesy American Diabetic Assoc.

Figure 10. What is diabetes?

INSULIN SHOCK

Insulin shock is likely to occur in a diabetic when, for any reason, the blood sugar falls. It results usually from the omission of a meal or the vomiting of a meal after taking insulin, or from the victim taking excessive amounts of insulin. Some attacks follow undue exertion. The majority of attacks occur in the morning and in the early evening. An individual whose blood sugar is depleted as a result of emotional excitement, exertion or exposure to cold has an increased sugar tolerance and reacts to insulin with a comparatively greater blood sugar drop than would otherwise be the case. This person is, therefore, temporarily insulin-sensitive and a candidate for insulin shock.

Reactions to insulin vary. When regular insulin is given, the reactions may be seen five to 20 minutes following an injection. With other types of insulin, the same reactions may not be seen for several hours.

SIGNS AND SYMPTOMS

1. General muscular weakness, together with mental confusion.
2. Restless, excited.
3. Profuse sweating.
4. Dizziness.
5. Pale, moist facial skin.

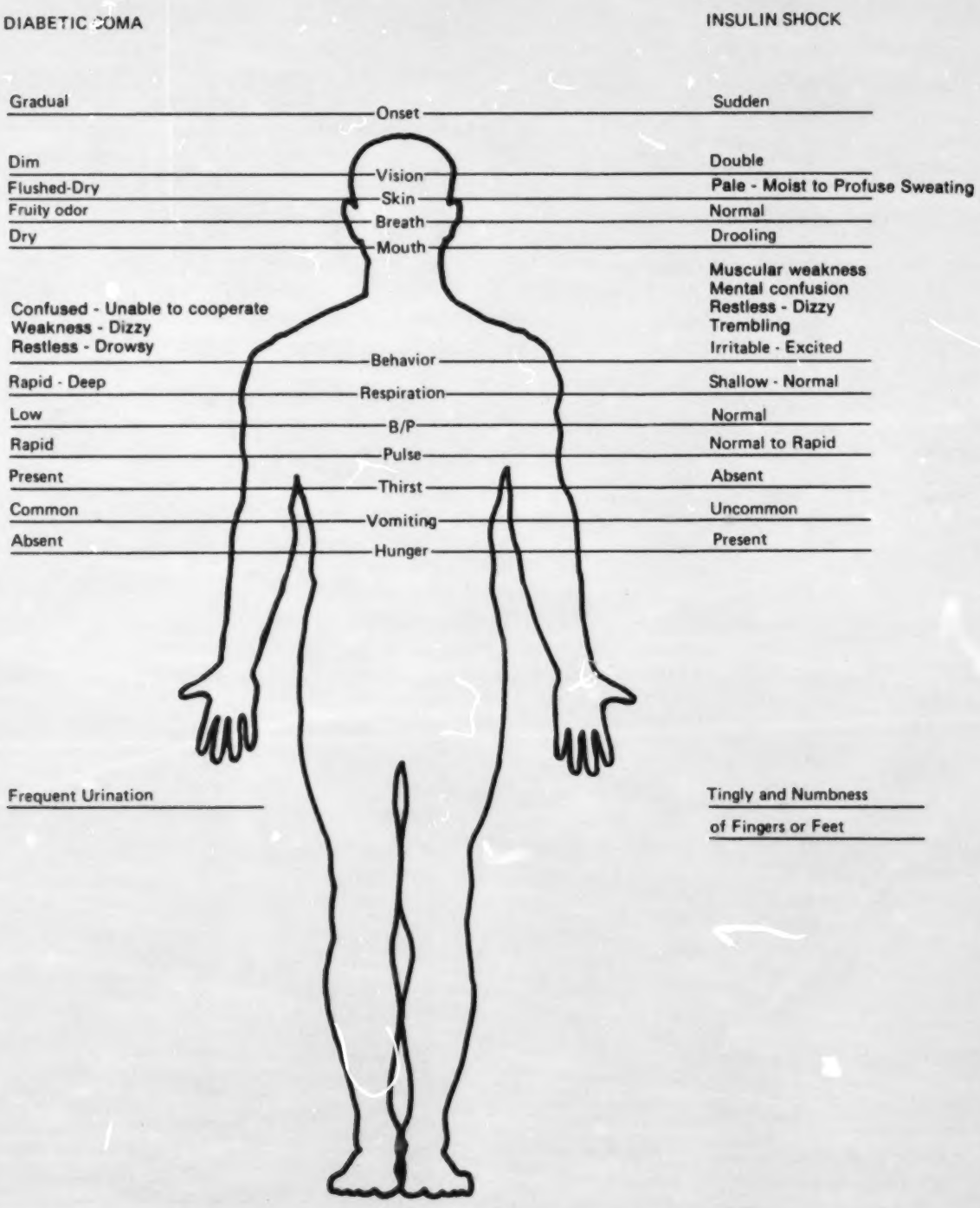


Figure 11. Symptoms of diabetic coma and insulin shock

6. Trembling.

7. Hunger pangs in the upper stomach.

The victim may lapse into a coma. Some victims' blood sugar levels lower so rapidly the symptoms progress to those of epileptiform convulsions almost without warning.

EMERGENCY CARE

When the warning symptoms appear, the victim immediately should be given a drink containing sugar or a piece of candy. Most persons taking insulin carry sugar in some form in their pockets. Taking sugar checks the reaction within a few minutes. If the sudden attack progresses to convulsions, care for the victim as you would any convulsing person.

If untreated, a reaction may result in extensive brain damage and possible death. These people should be transported as soon as possible to a hospital.

CRITICAL QUESTIONS

Two questions can be asked of the diabetic to determine which state the diabetic might be entering.

1. Have you eaten today?

2. Have you taken your insulin today?

If the person has taken prescribed insulin and *has not* eaten, going into insulin shock is likely. If a diabetic *has* eaten and has not taken prescribed insulin, this person is suffering from diabetic ketoacidosis. These two questions should be memorized and ready for use at any time by the EMT.

ADDITIONAL EMERGENCY CARE

Today diabetic ketoacidosis is fairly rare, but it does occur when the diet of a severely diabetic person is neglected or when the diabetic fails to take insulin. Occasionally DKA is confused with insulin shock. Remember, the two conditions arise from opposite causes and require entirely different treatment. Figure 11 lists the ways to tell the difference between these two conditions.

In some cases, the EMT may be certain the victim is a diabetic, but may be uncertain as to the existing reaction. If the EMT has any doubt as to whether the victim is going into DKA or insulin shock, a high sugar solution should be administered. This can be referred to as the lesser of two evils, for if the victim is going into insulin shock and sugar is not given, the blood sugar may drop causing brain damage. On the other hand, if the victim is going into DKA, the administration of a high sugar solution will definitely raise the blood sugar level. This can be corrected when the victim reaches definitive care whereas brain damage from an extreme low blood sugar cannot be corrected.

Note: Tubes of "Instant Glucose" and bottles of "Reactose" are available from some local diabetes associations. The contents, a jelly like substance according to the local Diabetes Association, can be administered to the conscious or unconscious victim. It should be given to the victim by squeezing it between the cheek and gums. This "instant glucose" or "reactose" should be carried by all emergency services. See Figure 12.

Figure 12. "Reactose" and "Instant Glucose" for insulin reaction

ABDOMINAL DISORDERS

The EMT should be able to identify abdominal injuries due to accidents and should also be aware of abdominal pain due to medical disorders. Two of the most common abdominal disorders the EMT will see are appendicitis and bleeding ulcers. This does not mean there are not other disorders that may be seen. If you are not sure of what the problem is or the acuteness of the problem, transport the victim to a medical facility.

SIGNS AND SYMPTOMS

While the signs or symptoms will vary according to the medical disorder, there are some general signs that are common. They are pain, tenderness, nausea, vomiting and shock. Some signs or symptoms for two of the most common abdominal disorders are as follows.

1. **Appendicitis**—pain in lower right quadrant may radiate to back. Loss of appetite, shock.

2. **Stomach ulcers**—cramps or pain in upper abdomen, tender rigid abdomen, blood in vomitus, black bowel movement. The victim may display the symptoms of hypovolemic shock from blood loss.

EMERGENCY CARE

A quick examination of the abdomen can relate much information to the EMT.

1. Look for distention of the abdomen.
2. Feel abdomen for tenderness, rigidity.
3. Determine if victim can relax the abdomen.

This can be accomplished very quickly. A check of the victim's pulse and blood pressure is also very important. A low blood pressure (below 90 mm Hg) and a rapid pulse are indications of hypovolemic shock. Treat them as such. Vomiting is common with these victims and the EMT must maintain a clear airway. **Never** give a victim with an abdominal disorder anything to eat or drink. Any victim experiencing sudden, persistent and/or recurrent, severe abdominal pain should be seen by a physician as soon as possible; treat for shock, and transport gently without delay.

ANEURYSM

An aneurysm can be described as a ballooned-out weak spot of a major artery such as the aorta. It may occur at any point along the artery. The most common sites for aneurysms are in the portions of the aorta that lie in the chest and in the abdomen.

The main factor in the formation of an aneurysm is the damage to the middle layer of the artery wall. This leaves only the thin lining and the outer fibrous tissue layers to withstand the repeated pulsing forces of blood flow; thus, the artery begins to dilate or balloon. As the aneurysm develops, progressive dilation continues in the weakened area and pressure is exerted upon surrounding organs and tissues.

SIGNS AND SYMPTOMS

In its early stages, no symptoms or only slight discomfort may be present from the aneurysm. Usually symptoms result from pressure on the adjacent organs and tissues. Therefore, the symptoms produced will depend mostly on the location and the size of the aneurysm.

The major symptom is pain and it often indicates a rapid and progessive enlargement of the aneurysm. If the weakened area ruptures, massive internal bleeding may occur and all the signs of an acute abdominal disorder may be present along with a marked drop in blood pressure and severe shock.

EMERGENCY CARE

Record the victim's description of how, where and when the pain started. Check and record vital signs often. If shock is present, it must be recognized early, and rapid-but-gentle transportation to the hospital is essential. Make the victim as comfortable as possible. Give all your information pertaining to the victim's condition to the emergency room personnel as soon after arrival at the hospital as possible.

POISONS

Local Poison Control Phone No. _____

DEFINITION

A poison is any substance which, when taken into the body or brought into contact with the body's surface, changes the function and structure to such a degree that it will affect the health or threaten life. Accidental poisonings usually involve children, while adults are more frequently involved in suicide or murder attempts or over-consumption of alcohol or drugs.

ENTRANCE OF POISONS INTO THE BODY

Poisons may enter the body by many routes. The most common route is **ingestion by mouth,** whether swallowed intentionally or accidentally; other routes include **inhalation** in the form of toxic gases or dusts; **injection** within the skin by bites of poisonous snakes, insects, rabid animals or by hypodermic injections; or **absorption** through the skin from poisonous liquids such as insecticides and herbicides.

Upon arrival, the EMT should observe the victim and surroundings carefully for empty pill bottles, loose pills and/or containers containing the substance taken. Nothing should be destroyed at the scene. Vomitus and other discharged matter should be saved and taken to the hospital for examination as it may contain the poison which cannot otherwise be identified.

CLASSIFICATION AND ACTION OF POISONS

Poisons entering the body by mouth are divided into three classifications: corrosive, irritant and neurotoxic substances.

CORROSIVE SUBSTANCES

The more common corrosive poisons are acids and alkalies that burn or eat into the tissue of the lips, mouth, throat and stomach. Besides the immediate corroding action on the tissues they touch, they cause an inflamed condition of the deeper tissues and in many cases, through absorption, exert harmful effects on the entire system. Some of the more common corrosive substances are acids from automobile batteries, industrial cleaners, disinfectants, alkalies found in drain cleaners, lye and household cleaners.

SIGNS AND SYMPTOMS

The lips and mouth are stained and show signs of searing or burning.

The conscious victim will complain of severe pain in the mouth, throat and stomach.

The victim usually has intense thirst.

The victim has difficulty talking or swallowing due to swelling of the mucous membranes.

The symptoms of hypovolemic shock will be evident.

IRRITANT SUBSTANCES

The irritant poisions, when swallowed, set up an irritation within the stomach, which is indicated by nausea, vomiting and severe pain. This type of poisoning is characteristic of a variety of compounds. Many irritants are found in combination with other substances used in many households, such as rat poisons, weed killers and cleaning compounds.

SIGNS AND SYMPTOMS

The lips and mouth may be stained or discolored or may appear white and shriveled.

A metallic taste in the mouth is a common symptom.

Severe pain in the stomach, followed by nausea and vomiting.

Shock is usually present in the more severe cases. Most of the symptoms of hypovolemic shock may be present.

NEUROTOXIC SUBSTANCES

These poisons primarily affect the nervous system. The neurotoxic poisons are divided into two general groups: (1) depressants whose general action is that of "sleep producing" with progressive lowering of the vital functions of circulation and respiration; and (2) convulsants that produce spasms or convulsions with rapid paralysis of the vital body functions.

DEPRESSANT POISONS

The depressants are usually medicines or drugs that are given to relieve pain or induce sleep but, when taken in excess, act as poisons. The more common depressants are opium, morphine, paregoric and sleeping powders or capsules.

SIGNS AND SYMPTOMS

The usual symptoms are weariness, drowsiness and progressive loss of sensibility ranging to a deep coma.

The face will be either pale or blue (cyanotic) and the skin is cold.

The pupils of the eyes are contracted to pinpoint size and do not react to light (especially opium derivative drugs).

The pulse is at first strong and slow but later becomes rapid and weak.

Respiration is shallow and irregular and may progress to respiratory failure.

CONVULSANT POISONS

The more common convulsant poisons are: cyanides, belladonna, strychnine and nitroglycerin. Each of these substances produces a variety of different symptoms.

Of all the convulsant poisons, the one the EMT should be most familiar with is nitroglycerin.

An overdose of nitroglycerin tablets used by people for the control of anginal pains can cause most serious effects.

SIGNS AND SYMPTOMS

The symptoms consist of a throbbing headache beginning in the front of the head and neck with increasing severity. There is an irregular pulse, dilation of the pupils, pain in the chest, muscular weakness, nausea and vomiting, unconsciousness and convulsions in extreme cases.

INHALED POISONS

Inhaled poisons affect the respiratory system and necessary resuscitative procedures must be instituted. The EMT must wear protective breathing equipment when entering a contaminated area.

Carbon monoxide is the most commonly inhaled poison that the EMT will treat and warrants special mentioning. Carbon monoxide poisoning affects a victim without warning. Sometimes a headache or dizziness will occur before unconsciousness but is many times ignored by the victim. In carbon monoxide poisoning the brain suffers from lack of oxygen, and many times death is the end result after only a short period of time. The most reliable sign of carbon monoxide poisoning is the "cherry red" color of the skin.

EMERGENCY TREATMENT OF POISONING

To treat ingested poisons (those taken by mouth), three general methods are recommended: dilute the poison, induce vomiting and give activated charcoal (powdered, in water).

Never induce vomiting in poisoning by acids, alkalies, petroleum or other volatile liquids. If the liquid burns on the way down, it will burn on the way up. In cases where the victim has ingested an acid or alkali substance it is best to dilute the substance by having the victim drink water or milk.

Having the victim drink large amounts of water provides necessary emergency dilution. For acids and alkalies, **dilution** with milk, if readily available, is effective. However, do not

overload the victim's stomach for this may cause vomiting.

In the case where the victim has ingested pills, medicine, etc., the treatment of choice is to induce vomiting.

To induce vomiting, give the victim one or two tablespoonfuls of **syrup of ipecac** followed by several glasses of water. Keep victim walking around if possible. This will usually cause vomiting very rapidly.

The use of powdered **activated charcoal** mixed in water will absorb the poison matter in the stomach. For charcoal to be completely effective, however, it should be given within 30 minutes of the poisoning. Also, the amount of charcoal administered should be 10 times that of the poison that was ingested.

The treatment of those who inhale poisonous gases is to administer 100% oxygen by the most effective method possible and remove the victim to fresh air immediately. Continue oxygen inhalation or resuscitation with oxygen and transport to hospital.

POISONS AND CHILDHOOD EMERGENCIES

Approximately 90% of all reported accidental poison cases involve children. It is estimated that 500,000 children are victims of accidental poisonings each year. Young children will eat and drink almost anything including kerosene, lighter fluid, paints, turpentine, furniture polishes, solvents and many, many other products.

The same rules apply to children as to adults. One tablespoon of **syrup of ipecac** with two or three glasses of water or carbonated soft drink is safe **except in the following situations.**

1. The poison is a strong acid, a strong alkali (lye, drain cleaners, etc.) or a petroleum product (kerosene, furniture polish, etc.).

2. The child is unconscious, semiconscious, or has convulsed.

If there is any suspicion that lye or other caustic material has been swallowed, the child should be taken to a hospital. Often the only way to be sure the esophagus has not been severely burned is to inspect it under anesthesia with an esophagoscope.

Be sure to **bring the container and any remaining medication or ingested product** to the hospital.

In all cases of known or suspected ingestion, all other children in the family or that had been playing with the child should be checked for the possibility of ingestion. Young children in particular often share pills or other substances with their friends or siblings.

A poison control center may be consulted if the distance to the hospital is great. Usually it is best to let the physician contact the poison control center.

SUMARY OF EMERGENCY CARE FOR POISONING

1. Notify the hospital prior to arrival, giving the following information:
   a. Quantity taken (if known)
   b. Victim's age and weight
2. Take poison container to hospital.
3. No fluids by mouth if the victim is unconscious.
4. Know the phone number and location of your nearest "Poison Control Center". These are located in most urban areas.
5. Treat for shock.
6. Administer oxygen.

SNAKEBITE

There are basically two types of venomous snakes in the United States—coral snakes and pit vipers. The coral snake is usually small and has brightly colored bands of red, black and yellow (the red bands border the yellow bands). The coral snake has short fangs and "chews" its venom into the wound. Pit vipers, which include rattlesnakes, copperheads and the cottonmouth, eject venom with fangs that are used to stab the victim. The fangs may be ¾ to 1½ inches apart, depending on the size of the snake. The head of the pit viper is broad, flat and almost triangular shaped.

SIGNS AND SYMPTOMS

1. A burning sensation or pain at the point of the bite, with swelling.

2. Puncture marks from the fangs.

3. Nausea and/or vomiting.

4. Respiratory distress. (This is especially true for victims of coral snakes. Venom from coral snakes is damaging to the nerves and can cause paralysis to the respiratory muscles.)

5. Shock. This can be of many different types.

EMERGENCY CARE

1. Move the victim out of range of the snake if this has not been done.

2. There should be a brief attempt to kill the snake for identification.

3. This victim is in dire need of anti-venom. Transport to the emergency medical facility immediately.

While en route to the hospital, the following emergency care should be administered.

1. Apply a constricting band (not a tourniquet) above and below the injury, but away from the swelling. The band should not be so tight that the pulse below it is stopped. A constriction band which depresses the skin is normally sufficient.

2. Remove all rings, watches and bracelets.

3. Suction is only beneficial if started within the first few minutes following the bite. Many leading authorities on snakebites feel the dangers outweigh the benefits and therefore **do not recommend it.** With this in mind, it is highly recommended that emergency medical services follow procedures (regarding suction of the bite) set by their medical advisors or receiving hospitals.

4. If the swelling approaches the constricting band, loosen the band and move it closer to the swelling in an attempt to prevent further swelling of the affected limb.

5. Do not allow victim to move about, as this will stimulate circulation and spread the venom. Keep affected limb lower than the heart.

Note: Most snakebites are not fatal. However, all snakebites are dreaded and therefore a state of shock from fear itself can exist. If the snake has been killed, it should be kept for identification. The proper identification is important so that proper treatment can be initiated.

ANIMAL BITES

Animal bites and bites inflicted by humans carry the danger of serious infection, plus the soft tissue damage that can be done.

EMERGENCY CARE

Wash the wound with soap and water if possible, or at least rinse with water. Place a sterile dressing and bandage as you would other soft tissue injuries.

An animal that has bitten someone should not be destroyed, but impounded for observation by a veterinarian. If it has already been killed, the carcass should be sent to a laboratory for examination to determine if the animal has rabies (hydrophobia).

CONTAGIOUS DISEASES INTRODUCTION

Many times after an emergency medical service has answered a call, had direct contact with the victim, and/or transported the victim to the hospital, it is found the victim is suffering from a contagious disease. Since there are many ways in which contagious diseases are transmitted, it is a must for all EMTs to take special care—not only of themselves and personal clothing but also of their equipment, supplies, and vehicles.

PRECAUTIONS

If the victim is suspected of having a contagious disease, the EMT must consider the following precautions: **immunization** of all quadpersons, **isolation** of the victim, and **elimination** of the agent.

Immunization—The prudent EMT will maintain active immunization for the range of diseases that are prevalent today. If there are any questions regarding total immunization contact your physician or the local health doctor.

Isolation—The victim of a contagious disease and the immediate surroundings of the victim can be isolated by covering with bed sheets, plastic, or similar material. The EMT should be protected by coverings such as cloth masks and gowns.

Elimination—Upon recieving a call for a response to a victim of a contagious disease, the EMT should use a backup vehicle if possible or as much disposable equipment and supplies as possible. This is most important in oxygen equipment. The use of disposable oxygen administration equipment is highly recommended. If this is not possible, then it is an absolute must that all oxygen equipment be cleaned after each use. The use of disposable linens on "known runs" is the best method of preventing the spread of disease. The medical requirements for the emergency ambulance recommends the patient area be constructed of a material that can be easily cleaned and sanitized. Reusable oxygen masks should be cleaned and disinfected after each use to prevent the spreading of germs.

Additional precautions that can be taken for specific diseases are listed in Table 1.

LICE

The infestation of lice on the human body is rapidly becoming one of America's leading health problems. They affect more than two million people annually. Anyone can be subject to lice infestation.

Lice are very social creatures and can spread rapidly from one person to another by personal contact from articles of clothing, bedding, or objects such as combs and brushes. They are no larger than the head of a pin and are gray to rust colored. Head and pubic lice are the most common varieties and are usually found in close association with their small, oval white eggs (do not mistake them for dandruff).

If an EMT suspects the victim being cared for has lice, the EMT should inform hospital personnel of suspicion of lice upon arrival at the hospital (this must be done discreetly). The EMT also should isolate the victim as much as possible.

If your suspicions are proven to be true, you must scrub the emergency vehicle and launder linens using very hot water. All EMTs in contact with the victim must shower and launder all clothing.

Seek and follow advice of hospital emergency physician

COMMON NAME	MEDICAL SYNONYMS	INCUBATION PERIOD	MODE OF TRANSMISSION	CARE OF VEHICLE AND LINENS *	CARE OF PERSONNEL **
Diphtheria	Membranous croup	1 to 7 days	Droplet infection and direct contact with cases or with a healthy carrier.	Launder linens.	Schick test. Immunize.
Scarlet fever	Scarlatina	1 to 7 days	Droplet infection, fomites, carriers. pets occasionally.	Scrub car Isolate or launder linen.	Dick test. Shower. Change and boil clothes.
Measles	Rubeola or Red measles	7 to 18 days; usually 9 to 11 days	Secretions from respiratory tract and eyes. droplet infection.	Launder linens.	Wash hands.
German measles	Rubella	5 to 21 days	Direct contact, droplet infection from nose and mouth.	Launder linens.	Wash hands.
Whooping cough	Pertussis	2 weeks	Droplet infection, carriers.	Scrub car. Isolate and Launder linens.	Shower. Change and boil clothes.
Mumps	Parotitis epidemic	12 to 24 days; usually 16 to 18 days	Direct contact, droplet infection from nose and mouth.	Scrub car. Isolate and launder linens.	Wash hands.
Chicken pox	Varicella	10 to 20 days; usually 14 days	Droplet infection from nose and mouth; direct or indirect contact.	Scrub car. Isolate and launder linens.	Shower. Change clothes.
Spinal meningitis or Cerebro-spinal fever	Meningococcus meningitis	3 to 7 days	Droplet infection from nose and mouth of patients or carriers.	Scrub car. Isolate and launder linens.	Shower. See M.D. for possible medication.
Typhoid fever	Enteric fever	10 to 15 days	Fecal contamination of food, water, or milk.	Isolate, launder and scrub areas or linen contaminated by fecal matter or urine.	Wash hands and face.
Tuberculosis	Koch's disease or TB	Varies	Infected sputum.	Change clothes. Launder linens.	Avoid close facial contacts.
Syphilis	Lues VD	3 weeks	Usually sexual contact.	Air and launder linens. (No special car care.)	Wash hands. If scratched call M.D.
Infantile paralysis	Poliomyelitis	7 to 14 days	Uncertain: possibly nose and throat.	Air car 12 hours. Launder linens. Wash equipment with soap and warm water.	Shower. Change clothes.
Hepatitis	Serum hepatitis or Infectious hepatitis	10 to 14 days	Infected blood.	Air car 12 hours. Boil linens if contaminated with blood or feces.	Wash hands.

* When a car is being "aired," it is not to be in service. To "scrub car" means to wash the entire inside of the squad car with soap and water.

** In all these conditions, except syphilis, the EMT should use cloth, contagious-disease masks.

Table 1. Handling of contagious diseases

EMPHYSEMA

Emphysema is a non-contagious condition that causes the breakdown or destruction of lung tissue. The tissues lose elasticity, and the ability to exchange oxygen and carbon dioxide is impaired. This impairment results in abnormally high concentrations of carbon dioxide and low concentrations of oxygen in the victim's blood. The level of carbon dioxide may be so high that the breathing center in the brain may be depressed to the point that the victim would stop breathing. In this case, the only stimulus to breathe is the low oxygen content in the blood supply to the breathing center of the brain.

SIGNS AND SYMPTOMS

The victim in advanced stages will suffer shortness of breath with even the slightest physical exertion. This may be accompanied with attacks of coughing, wheezing, dizziness and general weakness.

EMERGENCY CARE

Much has been discussed, pro and con, in regard to the proper emergency care of emphysema and especially in the administration of oxygen to this victim. The following general procedures will assist the EMT in the care of this victim.

Upon arrival at the scene, the EMT will follow the procedures in making a proper examination. This will include asking questions pertaining to the victim's medical history. If the information received indicates the victim is suffering from emphysema, the EMT will follow the procedures established by the victim's physician.

The usual care for difficulty in breathing will be administered; maintain an open airway, place the victim in a position of comfort (usually a sitting or semi-sitting position), support with oxygen. CAUTION: Oxygen should be administered at approximately 3 liters per minute. This is because a high concentration of oxygen will raise the oxygen level in the blood supply to the brain but will not lower the level of carbon dioxide. This could result in the victim's loss of drive to breathe and lapsing into respiratory arrest.

HYPERVENTILATION

DEFINITION AND CAUSE

Hyperventilation may be defined as either an increase in normal rate or depth of respiration. Conditions which may cause increased respiration are pain, respiratory disease, temperature, cardiac disease, disease of the diaphragm, certain drugs, hysteria or atmospheric conditions (heat).

This acceleration of O_2 intake causes a depletion of carbon dioxide. Carbon dioxide depletion depresses the normal respiratory drive and can cause respiratory arrest.

SIGNS AND SYMPTOMS

Symptoms of hyperventilation include numbness of the hands, fingers, and other parts of the body; prickling skin; trembling feeling; racing of the heart; lightheadedness; fainting, cramps of muscles (especially in the legs); clawing of the hands; and mild convulsions. This is a very painful condition.

EMERGENCY CARE

This condition can be treated by increasing the carbon dioxide level. This can be accomplished by helping the patient to calm down and breathe only through the nose with the mouth closed. Breathing into a paper bag is helpful. This causes the victim to rebreathe some of the expelled carbon dioxide forcing the level to return to normal. Having the patient concentrate on timing personal respirations with

emphasis on slowing them down is sometimes effective. The final, most important point is trying to keep the patient calm by creating a calm atmosphere by speaking slowly, in a well-modulated voice.

ASTHMA

CAUSE

Asthma is a condition caused by either an infection or an allergy that affects the pulmonary system. The bronchi, small tubes that carry air into the lung tissue, are in spasm. This spasm causes the tubes to constrict making respiration very difficult. Usually the asthmatic victim has no problem getting air into the lungs, but there is great difficulty getting the air out.

SIGNS AND SYMPTOMS

An acute asthmatic attack is a frightening experience. The victim will be very apprehensive, the eyes will be bulging, and the veins in the neck will be distended. The victim may have a persistent cough and be wheezing, especially during exhalation. The victim will be in need of air due to difficulty in breathing.

EMERGENCY CARE

Reassure and make the victim as comfortable as possible. Breathing is easier in the sitting or semi-sitting position. Ask the victim which position is best. If the victim is taking medication and it is available, the EMT can assist the victim in taking the medicine. First, read the instructions on the label. Administer oxygen by inhalation, and observe the victim constantly. Transport the victim while maintaining emergency care.

EPILEPSY AND CONVULSIONS

DEFINITION AND CAUSE

Epilepsy is a disorder of the brain which causes periodic seizures. Epilepsy is caused by excessive irritation or sensitivity of certain areas of the brain. Actual causes of epilepsy are unknown; however, there may be many different underlying conditions.

SYMPTOMS

Epileptic seizures may range from a very brief attack, lasting one to 30 seconds with no major motor activity (convulsion) and no evident loss of consciousness or memory (called a petit mal seizure) to severe seizures characterized by violent motor activity (called a grand mal seizure). The EMS is usually called for the grand mal type of seizure and not the nonconvulsive.

Many victims have a warning (aura) that an attack is coming. They may utter hoarse cries, their eyes roll upward and they may fall forcibly, often injuring themselves as they fall. Their lips, tongue, and ear lobes may turn blue (cyanotic) due to impaired respiration. They may bite their tongue and grind their teeth. Twitching may begin in one portion of the body, and progressively extend to the entire body, throwing it into convulsions. Involuntary bladder and bowel movements may also occur. After a period of time, the victim may lapse into total unconsciousness and the seizures will stop. On regaining consciousness, the victim may complain of a headache and appear confused. Many epileptic victims at this point suffer total embarrassment, especially if the seizure occurred in a public place.

EMERGENCY CARE

One of the first steps to be taken is to prevent victims from injuring themselves.

The head of the epileptic should be protected at all times. This can be accomplished by placing some soft material (pillow, blanket-

roll, etc.) under the head. The clothing around the neck and chest should be loosened. Convulsive motions should be guided and controlled to prevent the epileptic from further injury, but the victim **should not be forcibly restrained** during periods of convulsion.

It has been common practice in the past to place a padded tongue blade between the victim's upper and lower jaws between seizures. The EMT can cause teeth to be broken or injuries to the gums if this procedure is attempted **during** the seizure. However, the padded tongue blade may be helpful for the victim having more than one seizure in a row.

If it is to be used, the padded tongue blade must be inserted between the upper and lower teeth (the molars on the side of the mouth) during the **relaxed state between seizures.**

Respiration is usually impaired due to the diaphragm being involved in the seizure. This is not usually a problem because the victim will start breathing and "pink-up" after the attacks and between seizures.

The duration of the convulsion and the general reaction following it should be observed and included in the notes for the emergency room personnel. This information should include the length (in time) of the seizure, time interval between seizures if more than one, the parts of the body involved, and any other observation that may have a bearing on the seizure.

Note: Refer to your local epilepsy association for further information on this subject.

Available EMS Publications

For ordering and pricing information contact:
Vocational Instructional Materials Laboratory
The Ohio State University
154 W. Twelfth Avenue
Columbus, Ohio 43210
Phone (614) 422-5001

Emergency Victim Care—Student Manual (EVCM)
Emergency Victim Care—Instructor Manual (EVCIM)
Emergency Victim Care—Workbook (EVWB)
EMS Binder—2½" Three-ring binder (EMTB)
Advanced EMT Instructor Manual (EVAIM)
EMS Slide/Tape Series
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—Extrication — 79 slides (EMST-3)
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